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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/882,534	06/14/2001	Garo J. Derderian	MI22-1752	8714
21567	7590	06/04/2004	EXAMINER	
WELLS ST. JOHN P.S. 601 W. FIRST AVENUE, SUITE 1300 SPOKANE, WA 99201			THOMAS, TONIAE M	
			ART UNIT	PAPER NUMBER
			2822	

DATE MAILED: 06/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/882,534

Applicant(s)

DERDERIAN ET AL.

Examiner

Toniae M. Thomas

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 32-52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 32-52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 09/19/03, 03/16/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This action is an official response to the response filed on 16 March 2004.

Currently, claims 32-52 are pending.

2. Applicant's arguments (see arguments filed on 16 March 2004) with respect to the rejection of claims 32-52 under 35 USC §103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Kim et al. (US 6,270,572).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. *Claims 32-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emesh et al. (US 5,452,178) and Kim et al. (US 6,270,572 B1).*

The Emesh et al. patent (Emesh) discloses a memory array (figs. 3, 5-12 and col. 6, line 58 – col. 9, line 62). The memory array comprises the following elements: a plurality of capacitor constructions (col. 1, lines 11-15), each having a first capacitor electrode 54 over a substrate 52 (fig. 3 and col. 7, lines 3-6), wherein the substrate is a monocrystalline silicon wafer (col. 6, lines 58-62); a capacitor dielectric layer 66 over the first electrode (fig. 3 and col. 7, lines 8-13); a second capacitor electrode 68 over the

dielectric layer (fig. 3 and col. 7, lines 20-23); and an insulative barrier layer 64 to oxygen diffusion between the first and second electrodes (col. 7, lines 13-16). The barrier layer 64 is over the first electrode 54, and the second electrode 68 is over the dielectric layer 66 and the barrier layer (fig. 3). The barrier layer 64 comprises Al_2O_3 (col. 9, lines 25-29), which exhibits a k factor of greater than 7 at 20°C.

Emesh lacks anticipation only in not teaching that the Al_2O_3 insulative barrier layer is an atomic layer deposited insulative barrier layer.

The Kim et al. patent (Kim) discloses a method for depositing a thin film using atomic layer deposition (ALD) (figs. 1-8, 9A, 9B and col. 2, line 58 – col. 4, line 46). The thin film comprises a chemisorption (chemical adsorption) product of first and second substantially saturated precursor monolayers, wherein the precursors are different (fig. 9A or fig. 9B and col. 4, lines 37-46). In a specific application, the atomic layer deposited thin film is an Al_2O_3 layer, which is deposited onto a silicon substrate (figs. 10, 11, and col. 4, line 50 - col. 6, lines 28).

Since Emesh and Kim are from the same field of endeavor, the purpose disclosed by Kim would have been recognized in the pertinent art of Emesh by one of ordinary skill in the art at the time the invention was made.

One having ordinary skill in the art would have been motivated to modify Emesh in view of Kim, at the time the invention was made, by using ALD to deposit the Al_2O_3 insulative barrier layer 64, as taught by Kim, because the Al_2O_3 layer deposited

using Kim's ALD method has excellent step coverage as well as precise stoichiometry and high density (Kim – col. 1, lines 16-22 and col. 2, lines 21-26).

Emesh does not teach that the Al_2O_3 insulative barrier layer 64 has a thickness of less than about 12 Å. However, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to form the Al_2O_3 layer such that its thickness is less than 12 Å, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233).

Response to Arguments

4. As stated at the beginning of this action, Applicant's arguments with respect to claims 32-52 have been considered. However, the arguments are moot in view of the new ground of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toniae M. Thomas whose telephone number is (571) 272-1846. The examiner can normally be reached on Monday-Thursday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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MMJ

26 May 2004

A handwritten signature in black ink, consisting of a stylized 'M' followed by a horizontal line and a small flourish.

Mary Wilczewski
Primary Examiner